

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): David E. Clune et al.

Case: Clune 3-4-18

Serial No.: 10/037,067

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Group: 2143

Examiner: George C. Neurauter

Title: Method and Apparatus for Maintaining Multicast Lists in a Data Network

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The remarks which follow are submitted in response to the Examiner's Answer dated June 19, 2007 in the above-identified application. The arguments presented by Appellants in the corresponding Appeal Brief dated April 16, 2007, are hereby incorporated by reference herein.

In the Examiner's Answer at pages 10-19, the Examiner responds to various arguments raised by Appellants in the Appeal Brief with regard to the §103(a) rejection of claims 1-11 and 13-15 over 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,219,352 (hereinafter "Bonomi") in view of Donald E. Knuth, The Art of Computer Programming (2d ed. 1973) (hereinafter "Knuth").

The Examiner's Answer groups together certain claims which were argued separately in the Appeal Brief. In this Reply Brief, Appellants have conformed to Examiner's claim groupings solely to aid in identifying sections of the Examiner's Answer. This should not be construed as any admission that these claims which the Examiner has chosen to address as a group should stand or fall together; rather, Appellants continue to respectfully request that the Board consider the patentability of each claim argued separately in the Appeal Brief on its own merits.

Response to arguments presented for claims 1-3, 7, 8, 10, 11, 13 and 15: (pages 10-13)

Pages 11-12 of the Examiner's Answer cite MPEP 2144.03, which relates to official notice, to support the "position that, while Bonomi fails to recite circularly linked lists, the mere idea of a circularly linked list is of such 'notorious character' that one of ordinary skill in the art would have recognized the uses and features of circularly linked lists" and that Knuth has been used merely as an "evidentiary showing" to support that circular linked lists were of such an obvious nature that . . . the general use of a circular linked list would have been obvious to one of ordinary skill in the art at the time the invention was made and that Knuth merely fills the gap of Bonomi's deficiency regarding the express disclosure of circularly linked lists. Therefore, the Examiner submits that the first requirement of a prima facie case of obviousness has been met, namely that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."

Even if one accepts the contention that "the mere idea of a circularly linked list" was well-known in the art at the time the invention was made, this does not support the conclusion that it would have been obvious to have modified the method of Bonomi to incorporate circularly linked lists so as to reach the limitations of claim 1. See, e.g., *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (U.S., 2007) ("[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.") See also MPEP 2143.01(iv) ("A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).")

Despite the elaboration added by the Examiner in the present Examiner's Answer, Appellants submit that the Examiner has still failed to identify any objective evidence of record which supports the proposed combination. That is, there is no objective support given for why one would be

motivated to modify Bonomi to include the teachings of Knuth. In order to avoid the improper use of a hindsight-based obviousness analysis, particular findings must be made as to why one skilled in the relevant art, having no knowledge of the claimed invention, would have combined the teachings of Bonomi and Knuth in the claimed manner. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *KSR*, 127 S.Ct. at 1741 (Especially when examining “a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”); *Id.* (The analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue should be made explicit.”)

On page 12 of the Examiner’s Answer, “it is also asserted by the Examiner that the recited steps of forming and traversing a linked list are applicable to both general and circularly linked lists as taught within the teachings of both Bonomi and Knuth. Therefore, one of ordinary skill in the art would have expected the recited steps to operate with a circularly linked list in the same manners [sic] as described in Bonomi. Therefore, the Examiner submits that the second requirement of a prima facie case of obviousness has been met, namely that there must be a reasonable expectation of success.”

Appellants respectfully disagree with the contention that “one of ordinary skill in the art would have expected the recited steps to operate with a circularly linked list in the same manners [sic] as described in Bonomi.” For example, Knuth itself teaches that the formation of a circular linked list requires additional steps compared to a linked list. See Knuth at page 271, fourth paragraph (“The alert reader will observe that we have made a serious mistake in the above operations. . . . We have forgotten to consider the possibility of an empty list. . . . If we take the position that PTR will equal A in an empty list, we could remedy the above operations by inserting

the additional instructions. . . .”) Likewise, Knuth also teaches that traversing a linked list, in particular “terminating the traversing step when all linked destination nodes have been processed” as recited in claim 1, is implemented differently when using a circular linked list then when using the conventional linked list taught in Bonomi. See Knuth at page 272, first and second paragraphs (“The natural question to ask, in connection with this observation, is ‘How do we find the end of the list, in view of the circular symmetry?’ There is no λ link to signal the end.”), which discusses two alternative methods of determining when to terminate traversal, each of which is of greater complexity than that associated with a linked list.

Accordingly, in light of the teachings away of the prior art, as well as the failure of others to utilize circular linked lists in conjunction with multicast groups, Appellants respectfully submit that the Examiner’s conclusory statements are insufficient to prove a reasonable expectation of success without undue experimentation.

On page 13 of the Examiner’s Answer, “the Examiner submits that all of the requirements for a proper prima facie case of obviousness have been met. The Applicant has also failed to provide any other arguments or evidence to show unobviousness [sic].” Appellants respectfully disagree with both contentions and refer to the arguments made by the Appellants on pages 7-8 of the Appeal Brief and reproduced herein:

Appellants note that Bonomi was filed in 1997 and Knuth published in 1973. Appellants respectfully submit that the failure of other researchers in this field of endeavor to render the allegedly obvious invention disclosed in the present application during the long period during which both references were publicly available and well known to those skilled in the art constitutes objective evidence of non-obviousness and only further lends support for the patentability of the present invention.

More generally, these other researchers have presumably been aware of the existence of both circularly linked lists and multicast groups for at least two decades, since the introduction of the above-cited RFC 966 reference in 1985. One cannot help but wonder why these other researchers have heretofore failed to use a circularly linked list for multicast groups, despite the considerable advantages that Appellants have determined result from such an arrangement. The answer is that these other researchers, although presumably aware of the existence of both circularly linked lists

and multicast groups, never thought to put the two separate ideas together in the manner disclosed by Appellants, and hence have been unable to achieve the associated advantages. . . .

Appellants respectfully submit that this alleged *prima facie* case is deficient as the Examiner has failed to provide a proper motivation to combine Bonomi and Knuth, as discussed above. Furthermore, Bonomi teaches away from the proposed combination by teaching the use of conventional multicast lists rather than the claimed circular linked lists.

Furthermore, even if one were to assume for purposes of argument that the Examiner has established a proper *prima facie* case of obviousness, Appellants respectfully submit that there is sufficient evidence of nonobviousness so as to rebut any such *prima facie* case. For example, the fact that others have used a less advantageous technique, rather than combining the separate but well-known techniques disclosed in the cited references, suggests both a long-felt need and failure of others.

Indeed, the assertions found on pages 10-12 of the Examiner's Answer, that both Bonomi's teachings regarding the use of linked lists in multicast groups and Knuth's teachings regarding "the general use of a circularly linked list" are of "notorious character" serve to provide further support to the Appellants' previous arguments.

Response to arguments presented for claims 4-6: (pages 13-17)

Page 13 of the Examiner's Answer asserts that Bonomi "does at least reasonably suggest, if not disclose" the limitations of claims 4-6 wherein at least one destination node of the list, as determined from the received data, is excluded from the multicast session; wherein the received data includes an indicator identifying the destination node that is to be excluded from the multicast session; and wherein the indicator identifies the destination node from which the data was received as the destination node to be excluded from the multicast session.

In formulating this rejection, the Examiner relies upon Bonomi at column 10, lines 12-41, which is characterized on page 17 of the Examiner's Answer as disclosing that "a node sends data to the data switch wherein the data includes information on where the data has arrived from," and Bonomi at column 11, lines 26-47, which the Examiner characterizes on page 17 as disclosing that

“when the determination is made as to where the received data is to be sent to, there is a provision that allows for the data not to be sent to a destination node.”

Even assuming that the Examiner’s characterizations of the teachings of Bonomi are accurate, i.e., that Bonomi teaches determining the node from which data was received from the received data and also teaches excluding a destination node, the Examiner apparently concedes that Bonomi fails to disclose at least the limitation of claim 4 wherein the destination node to be excluded is determined from the received data, much less the additional limitations of claims 5 and 6.

More particularly, the Examiner argues that “[s]ince it does not make reasonable sense to send data back to a node that has sent the data in the first place, Bonomi essentially discloses these limitations since excluding the ‘destination node’ that actually sends the data that has been received would have been at least reasonably inferred from the disclosures of Bonomi.”

Based on the above statement, the Examiner appears to be relying on inherent disclosure. Applicants respectfully submit that, as noted in MPEP 2112, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

The Examiner also contends that “it would have been considered to be common sense to those of ordinary skill regarding the transmission of data between computers that conventional data transmission systems do not generally send data back to the source of such data, especially when it is possible to indicate to the system that the cell should not be sent to a particular node.”

Here, the Examiner appears to be relying on official notice. As noted in MPEP 2144.03, “[o]fficial notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known.” Appellants submit that this is not the case. Moreover, Appellants had respectfully requested that Examiner provide either documentary evidence or an affidavit or declaration setting forth specific factual statements and explanation to support the finding, as required by 37 C.F.R. § 1.04(d)(2) in order for such a rejection to be maintained.

Appellants submit that, despite Examiner’s contentions that “it does not make reasonable sense to send data back to a node that has sent the data in the first place” and that “it would have been considered to be common sense to those of ordinary skill regarding the transmission of data between computers that conventional data transmission systems do not generally send data back to the source of such data,” there are a number of data transmission systems which do send data back to the source of said data, for example, in order to permit the sender to verify that the data was transmitted and received accurately. See, for example, D.R. Cheriton & S.E. Deering, IETF RFC 966: Host Groups: A Multicast Extension for Internet Protocol, December 1985, <http://tools.ietf.org/html/rfc966>, which was previously cited by Appellants on page 4 of the Appeal Brief and on page 3 of the Response to Final Office Action filed December 22, 2006, and which states on page 9, beginning with the third paragraph:

When an IP packet is sent with a host group address as its destination, it is delivered with “best effort” datagram reliability to all members of that host group. The sender need not be a member of the destination group. We refer to such a group as open, in contrast to a closed group where only members are allowed to send to the group.

Thus, Cheriton & Deering teaches a technique in which a multicast packet is delivered to all members of a destination group, which may include the sender of that packet. Accordingly, it neither necessarily flows from, nor is capable of instant and unquestionable demonstration from, Bonomi that the destination node from which the data is received should be excluded.

Knuth fails to supplement the above-noted fundamental deficiencies of Bonomi as applied to dependent claims 4-6. Accordingly, the combined teachings of Knuth and Bonomi fail to teach or suggest each and every limitation of each of claims 4, 5 and 6.

Response to arguments presented for claims 9 and 14: (pages 17-19)

The Examiner relies on column 12, lines 7-14, and column 13, lines 23-31 and 40-45 of Bonomi. These two passages of Bonomi are directed towards two entirely different sets of linked lists. Column 12, lines 7-14 of Bonomi teaches the use of a linked list to keep track of the free locations available for storing received cells, with the tail pointer being updated each time a free location is added and the head pointer being updated when a free location is provided for storage of a newly arrived cells. As this linked list does not contain any data regarding destination nodes at all, its relevance to the limitation of claims 9 and 14, wherein an address for entering a circular linked list of destination nodes is the destination node from which the data was received, is unclear.

Column 13, lines 23-31 and 40-45 of Bonomi, on the other hand, is directed toward a logical queue which stores pointers to cells to be transmitted. Even accepting the Examiner's characterization of this portion of Bonomi as disclosing that "the head pointer which indicates where to enter the list is the oldest entry of data to be transmitted and that the tail pointer is updated when new data is received," Appellants respectfully submit that it does not therefore follow logically that "the address used to enter the list is, by virtue, the destination node which sent the data." Although Bonomi teaches that the "tail pointer identifies the storage location of the last cell received on a connection," (column 13, lines 31-32), and that the "head pointer for a logical queue points to the next cell to be processed in the cell order for that logical queue (branch)." (column 13, lines 43-45), there is simply no teaching or suggestion that the oldest entry of data to be transmitted corresponds to the destination node which sent the data.

Knuth fails to supplement the above-noted fundamental deficiencies of Bonomi as applied to dependent claims 4-6. Accordingly, the combined teachings of Knuth and Bonomi fail to teach or suggest each and every limitation of each of claims 9 and 14.

For the reasons identified above and in their Appeal Brief, Appellants respectfully submit that claims 1-11 and 13-15 are allowable over the prior art of record.

Date: August 20, 2007

Respectfully submitted,

Joseph B. Ryan
Reg. No. 37,922
Attorney for Appellant(s), by

A handwritten signature in black ink, appearing to read "David E. Shifren". The signature is written in a cursive, flowing style.

David E. Shifren
Reg. No. 59,329
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517